Profit Pasture Prophet

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GRAZING RUMINATIONS

by Jim Cropper, Editor

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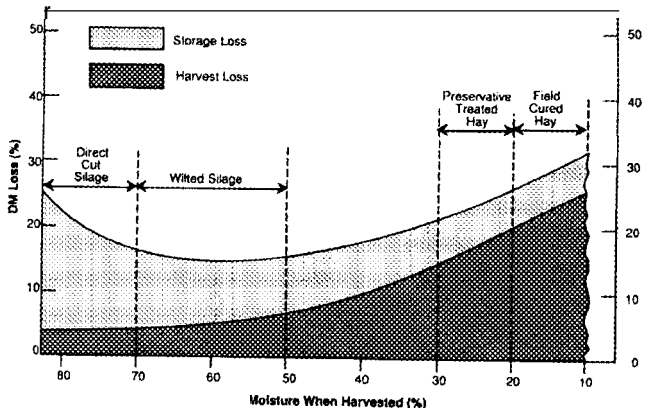
I am going to embark on a topic that is a bit of a challenge for me, but gets at the heart of the matter of why pasture was dismissed as being inefficient 40 years ago. Unfortunately, the quotation coming up is still being used today. "First, legumes and grasses managed as pasture yield 15-25 percent less than when cut for hay. Second, grazing losses from trampling and fouling range from 10-25 percent. Thus, the amount of forage actually consumed by grazing cattle may be 25-50 percent less than the potential hay yield of pastures."

It really does not matter where the quotation comes from, because it has been expressed in many different ways by many different forage industry leaders over my lifetime. It does not help when farmers hear researchers say at conferences that utilization rates of pasture are only 35 percent. This is on intensive rotational pasture! That is worse than the quotation above!

The largest part of the problem is that they are trying to compare apples with oranges. Some of it also is the use of terminology that is assumed to be understood by all, but is not. It also could, at times, be misapplied terminology. Everytime there is a misconception, it sinks pasture to the bottom. So, I will take a stab at trying to show why pasture is under-rated.

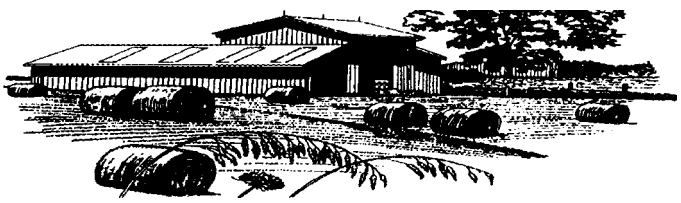
First of all, stored forage making and storing is not as efficient as it is cracked up to be. Looking at the graph below, there are big losses in dry matter. It does not even reflect storage losses suffered by round bales left to the elements. Secondly, stored forage utilization efficiency figures typically do not include the stubble left in the field. Yet, with pasture often the percentage of usage includes all the top growth from the ground, up. Thirdly, the best quality forage is harvested as pasture. The quality of the forage has only one direction to go once it is cut, down! In fact, stored forages are typically cut at a later stage of maturity than forages grazed by livestock on pasture. Their initial quality is already behind that of pastured forage. See Table of Effect of Harvest Date On Orchardgrass Forage Quality. Tonnage is not everything; digestible dry matter and nutrients are.



Source: Hoglund, 1964.

If we take a closer look at the quotation above, two words are key to the premise being made: actually and potential. The word actually is applied to the pasture scenario. Potential is applied to hay yield, stored forage. The premise is already biased against pasture because it is must live up to an actual situation rather than a potential one. I am here to tell you right now that in the Northeast potential hay yields are seldom realized. Take a look at any Agricultural Statistics book for any given year and you will see some northeastern state average hay yields around two to three tons per acre. This is a far cry from that potential yield envisioned by the person I quoted. Then we have the storage losses that can run as high as 40 percent if round baled and placed unprotected along some field's edge. You may as well cut half of your acreage for hay in a more timely fashion, store it right, and let your livestock graze the other half! Save yourself the hassle of harvesting something that will be half gone by the time you feed it!

The potential yield of harvested forage is rarely achieved anywhere. There are cutting losses, leaf shatter, weathering, leaching, and losses to disease, insects, and mammalian herbivores, big and small, to contend with. Rainy weather delays timely harvest of stored forages, despite all the exhortations by forage specialists. It's easy for them to say: "Cut it, rain or shine." They are not the farmer who expects the worst to happen, mulch or heifer hay from the seemingly inevitable downpour or stalled bad weather system. Quality decreases as the forage matures. As shown in the table below, potential quality grass hay is rarely put up. Think about it, how often do you see orchardgrass cut at boot stage? I could not resist tagging the stored forage as potential and actual. Meanwhile, a grazing animal could care less whether it rains or not. And, the green forage of pasture just gets greener.



Effect of Harvest Date On Orchardgrass Forage Quality

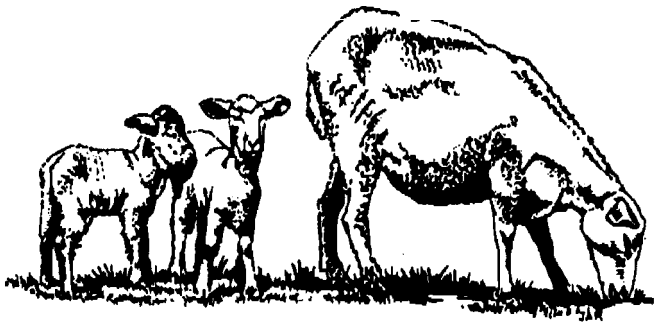
Maturity	Digestible Dry Matter	Crude Protein	Forage
	---%Dry Matter---		
Vegetative	77	17	Pasture
Boot-early head	71	13	***Potential as Stored***
Late head-early bloom	65	9	***Actual as Stored***

(From Reid, et al. 1966)

When comparing the two alternatives, we need to use the same forage mass for comparison as well. Stored forage yields and harvest efficiency are not based on total herbage mass. They are based on what can be harvested above the stubble height left by the mower. However, the low utilization rates quoted for pasture are based on total herbage mass that is everything, leaf and stem from the ground, up. This is 2-4 inches of material not even recognized as economically recoverable by the hay people. Pasture utilization efficiency should really be based on available forage, the forage accessible to the grazing animal. This means stubble is left behind, just as that left behind by the mower when harvested as stored forage. In fact, I define available forage as the forage above that stubble height needed to keep the desired forages in the pasture alive and well. This can often be a higher stubble height than that left by the grazing animal, depending on forage species and type of livestock in the pasture.

The upshot of my argument is: If compared on an equal basis, total digestible dry matter and discounting stubble, utilization efficiency is comparable for the two harvest systems, stored forage and pasture. Good managers of both can achieve 80 percent harvest efficiency. Utilization efficiency on pasture can be carried too far. You could be so efficient that you overgraze it. Pasture utilization above 80 percent is possible, but animal performance will drop and the more desirable forage plants may be replaced with weeds and less palatable forages.

ROTATION REVELATIONS



Okay, sheep farmers listen up! Finally, I got around to you! I found this to be a very informative article on sheep production on pasture in ***The Monthly Livestock Reporter.*** This magazine is published in Lancaster, Pennsylvania. If you area livestock producer, you may want to subscribe to it. Subscription fee is $15.00 per year. Mailing address is: Livestock Reporter, PO Box 4632, Lancaster, PA 17604-4632.

I played Reader's Digest with the article so the version you see here is condensed. To be profitable with sheep in the Northeast, you need to profit by the market presented by the diversity of ethnic and religious groups residing close to your farm. Bob Russo, the farmer featured in this article, did that exactly. By splitting the flock into five lambing groups, he not only met customer demand; he also spread his workload saving on hired labor. Not bad!

Commercial Sheep Grower Nurtures Land, Expands Flock

by Sherry Bunting
Livestock Reporter Editor
The Monthly Livestock Reporter
Lancaster, Pennsylvania

(Reprinted with Permission from ***The Livestock Reporter,*** PO box **4632,** Lancaster, PA.)

When Bob Russo and his wife Dawn first brought their flock of 80 Suffolk-Targy ewes to Somerset from the 53-acres they had previously farmed outside of York the plan was to expand the flock and move full-time into the sheep business. What they found was that they had their work cut out for them on the 250 acre farm they had purchased.

The lay of the land was exactly what Bob was looking for, he recalls: "Being that sheep are such defenseless animals, we wanted pasture ground where we could see all the sheep and where they had access to water." However, the Russos quickly discovered that "ground zero" was the extent of what they had to work with in the beginning. "There wasn't a pasture on the place," Bob reflected. "The land had been plowed in continuous corn with one strip of grass. It was basically all corn stalks and weeds and a good bit of bare ground when we came," he continued.

Stubbornly refusing to become discouraged, Bob and Dawn worked diligently to transform the former grain and dairy farm into the productive and fictional pastoral setting they had visualized. Through the evolutionary process of restoring pasture vitality to the land, Bob became the first farmer in Somerset County (sheep or cattle) to implement intensive rotational grazing in 1985. Five years later, in 1990, he was named Somerset County Conservation Farmer of the Year.

Five years into the sheep business on the York County farm, Bob decided he wanted to farm full time and give up "the day job." So the Russo's bought the Somerset County property where they now have their commercial sheep operation. Driving down the lane to Russo's "Bell Wether" farm on a warm May evening just as the sun was chasing the last of a spring rain - it was hard to imagine the expanse of paddocked green meadows and gently rolling hills as anything other than the mature well managed pasture Bob has spent ten years developing for his flock which now numbers at nearly 400 ewes.

Like the male sheep (wether) with the bell collar leading the way for the rest of the flock - "Bell Wether" farm has not shied away from new

pathways in both pasture and production management.

"We were guinea pigs," Russo admitted, adding that, now, ten years later, 150 farmers in Somerset County are using intensive rotational grazing techniques in their cattle and sheep operations. But, before Bob could start, even a traditional grazing program, he had to build up his grasses and legumes.

"Frost-seeding" the sparsely vegetated and honeycombed late winter ground, Bob planted birdsfoot trefoil and followed up with an application of lime ad fertilizer. According to Russo, who takes an organic approach to pasture management, that was the last time he remembers buying fertilizer at Bell Wether. He maintains that he does no harrowing (leaving the job of breaking up the manure to the soil microbes).

Bob also refrains from using herbicides on his pasture vegetation. With the exception of breaking out his Woods rotary mower twice each year to control the thistle population by clipping the paddocks as the thistle are just coming to a head before they go to seed, Bob relies solely on the natural ecology of the land to keep his pastures productive and thriving. - the sheep, their droppings, nitrogen-replacing legumes and the existing microbial balance of healthy soil.

Using the old rule of thumb-five sheep or one cow per acre of pasture - Bob's initial late winter "frost seeding" got his sheep grazing the first year. Then, in 1985, he met Roger Wentling from the former Soil Conservation Service (SCS) in Somerset County. With Wentling's help, Russo setup 32 two-acre paddocks for two-day rotational grazing system capable of handling 200-300 sheep per paddock - depending on the season. (A ten-day rotational system and larger paddocks are planned for land on the other side of the road.)

The key to it is in the numbers, Bob explained - which suits the former accountant just fine. "You have to get the right number of head, and the number of days and let them graze it down. " Bob said. "The principle works just as well on a smaller farm," he continued, adding that in times of drought the numbers have to be adjusted to allow for a longer "rest" period between grazings for each paddock. Confirming that a 30-day rest is the key, he explained that during the height of the spring growing season, cutting that rest time in half is important so that the fast growing pasture doesn't get ahead of the sheep.

Weather can be a health factor with any grazing program because sunshine is necessary to dry out the paddock and keep down the parasites. Here again, the paddock rest period is important in taking care of the parasites and eliminating extra dewormings.

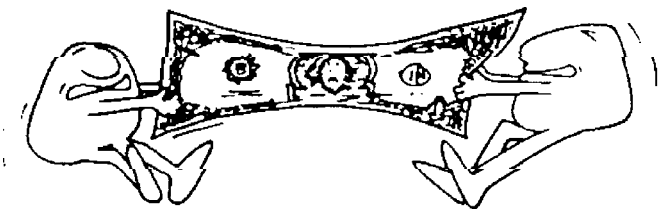
Following the traditional Fall breeding schedule for the Spring Easter lamb trade, Russo started out with the simple goal of bringing his flock numbers up to around 300 head. But after awhile, he began examining the economics of the business in a fluctuating and at times depressed lamb and wool market - leading him to the decision to start splitting the flock for lambing in both the Fall and Spring (for the Christmas trade as well as various Muslim holidays).

Three years ago, after that initial attempt at changing the flock's lambing schedule, Bob had a conversation with Brian Magee at Cornell about their "Star System." What he discovered was that he had the wrong sheep - the kind that will only go into heat when the days get shorter in the Fall. So he set about buying Finn-Dorset rams to affect the breeding program by producing females which will go into heat at various times of the year. But it's been difficult at the beginning, Bob said "You have to be patient."

During the first year of the program, for instance, Bob kept the lambs and sold the ewes. "Initially productivity went down from a lambing rate of 135% to 127%. "It's been like a dairyman trying to make a living milking heifers," Bob explained.

Now, as those first year lambs retained for breeding reach a more productive age, the lambing rate at Bell Wether is climbing to 177%. The objective of Cornell's (five-point) Star program is to have lambings occur within the flock five times per year - with the year divided into five "points" each 73 days apart. A "star ewe" is one which lambs five times in three years. "Even if you don't have "star ewes" and you miss a cycle, you're still getting one in nine months," Bob pointed out.

At 177%, Bob's lambing rate, under the Star system, gives him the same number of marketable lambs -500- that he would have under the conventional breeding system using 100 additional ewes. Bell Wether's marketing objective is being met with the Star system. Lamb marketing are spread out so that pay day occurs more than once or twice a year. Furthermore, Bob can handle all the lambing without having to hire someone because his 382 ewes are not all lambing at the same time. Lambs are weaned at 65 days and the breeding process begins right away again, To meet the 73 day interval of the Star program, the ewe must dry off and breed back 10 days after her lamb is weaned. In order not to throw off the schedule, a ewe who misses that next interval is held to the next 73 day interval. This way, producers, like Bob, know precisely when the batch of lambings will begin and when they will end - a tremendous time and labor management tool as well.



THE BOTTOMLINE

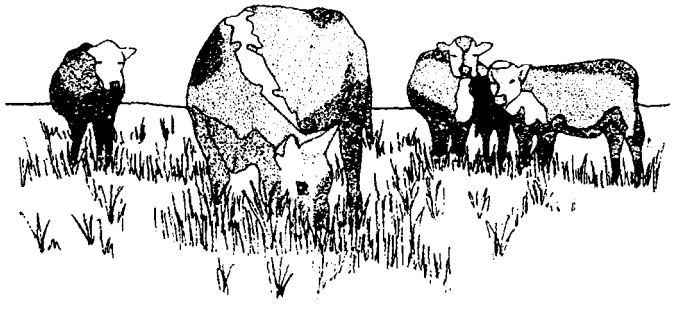
With any new innovative technology there are always promoters that tend to promote the technology as an end-all, be-all panacea. It is sure to cure your problems with profitability and make you wildly successful. Quite possibly, even improve your attractiveness to the opposite sex. So it goes with management intensive grazing, intensive rotational grazing, intensive rotational stocking, or whatever one of a dozen other terms used to describe stocking animals intensively on pasture. Hence, the reason it is known by so many different names. Every promoter needs a hook or a product label to pitch.

We have to take care as the promoters, and as the customers, to make sure the situation we face is ready for the technology cure we prescribe for it. We do that if we are honest promoters or wise customers. The following article from the Drovers Journal illustrates how a technology or management practice is just one of several options that a customer can select from to improve their bottom line in a cow-calf beef operation. If that cow-calf operator is not doing many of the animal husbandry items to improve cattle feeding efficiency and reproductive health, rationing available pasture through grazing management may do little to improve their bottom line. It will depend much on the current stocking rate for one thing. If the calves are light weight at weaning, or the cows are in poor condition to be bred back, then a more intensive grazing system that improves forage productivity and utilization may provide part of the answer. If the farm is already understocked, then moving to an intensive rotational stocking system may do little to improve individual animal performance. Hence, the ranges seen in return per cow, The latter customer would need to add cow units and increase return per acre. This may not be a goal of theirs, however, for several valid personal reasons.

With the limited dollars a customer has to spend on a tight margin enterprise, we also have to be aware that they may make the decision to do a less involved, more comfortable technology change (perceived or actual) to improve their bottom line.

As illustrated in the article, the cow-calf manager has many options to improve their return on the investment from a production unit, the cow. There are lots of sales pitches coming from product promoters of other technologies. All of these competitors have to survive off an industry not noted for its profitability. The customer is more likely to select from the practice menu those practices that least disrupt their life as they perceive that to be, or the glitzy presented one.

The grazing management option has a rate of return that is only somewhere in the middle of the pack. So there is nothing to set it apart as being special except when it improves a degraded environment. This is the primary reason the Natural Resources Conservation Service promotes better grazing management practices. When we promote a practice to improve the environment, we must be sure it is also right for the customer. The customer will be the custodian and owner of the practice. The practice can be easily tossed aside as it is uttered as a thought, or after a trial period on the farm. Sales pitches need to be accompanied by some friendly service. Otherwise, the customer moves onto a promoter who takes the time to care if the customer is happy. One who can set them straight, if the practice is misapplied or some unforeseen event requires some fine-tuning of the by-the-book approach.



Management Practices Offer Higher Returns

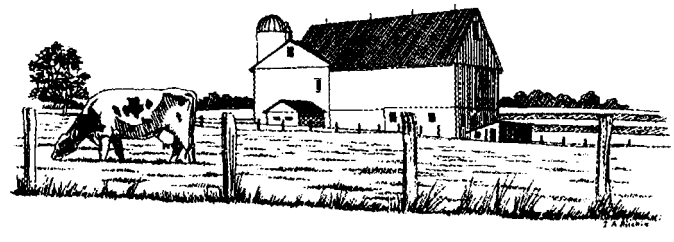
Reprinted from Drovers Journal, February, 1995.

Cattlemen can reap economic rewards by following certain management practices that offer greater return and less risk in their cow herd.

Practice	**Return Per Cow**
Pregnancy testing and culling	***$30***
Health program (vaccinations)	$5-$20
Bull soundness evaluation	$3-$50
Controlled breeding season	$50
Early breeding heifers	$10
Performance tested sires	***$30-$90***
Easy-calving sire on heifers	$10-$60
Growth implants in calves	$7-$25
Prescribed range burning	$15-$40
Rotational grazing	$10-$20
Year-round mineral supplement	$5-$12
Estrous synchronization	$3-$12
Artificial insemination	$7-$30
Crossbreeding	$15-$30

Texas Agricultural Extension Service demonstration trials show a wide range of expected returns per cow by implementing such practices. While weather, market prices and level of dedication to efficient management can make a difference in total dollars returned, the dollar values reported were taken from trials held under average environmental conditions.

Extension specialist David Finley points out that while implementing all of the following practices obviously will not result in returns equal to the sum of all dollar amounts, a combination of several practices should have a cumulative effect on income.



HERD HEARSAY

This is the second installment of a three part series. It is a paper by Dr. Ed Rayburn on dairy cattle nutrition on pasture. Ed talks about the **VALue** of pasture to dairy cows. Three management factors affect pasture forage quality and quantity. They are:

1. Keep pastures in a Vegetative growth stage. Translation: Don't let your forages go to seed!
2. Provide adequate forage Availability. Translation: Don't starve them or your milk check will go south!
3. Maintain pasture Legume content. Translation: Don't forget the dessert and pass on the concentrates!

In our last issue, Ed filled you in on why keeping pasture forages in the vegetative state is so important. In this issue, Ed talks about forage availability for milking cows. This is the most critical issue pertaining to dairy cow nutrition on pasture. It is the issue to my mind that will make or break pasturing milk cows as a widely accepted practice. It is common to hear talk about loss of milk production on pasture. It surfaced again at paper presentation at the Northeastern Branch of the American Society of Agronomy Conference at Orono, Maine in June. People were shocked by the dramatic drop in milk production suffered by one dairy herd on pasture. The problem was confounded by the fact that the dairy owner was also going to seasonal dairying. He was delaying drying off many of his cows to get them bred at the right time for a short calving season. The delay in drying off the cows produces a prolonged period of relatively low milk production. Nonetheless, it points to an Achilles heel of pasture, dry matter intake. As I said above you cannot starve them. Enough forage must be available so that milk cow can get a full mouthfull with every bite! If she has to work for it, you lose! It is easy enough to monitor. Just check the amount of milk in the tank each day.

Study the following installment carefully. Pay particular attention to the last two sentences of Ed's advice. Some of our pastures out there cannot support a milking herd. There simply is never enough dry matter out there for a dairy cow to get fill mouthful each and every time! This is beautifully illustrated with Figure 3. If the pasture only had an initial forage mass of 1000 pounds of dry matter per acre, right at the git-go dry matter intake would already be depressed by about 20 percent. A pasture that could only produce 500 pounds of dry matter per acre would reduce intake by 50 percent.

If we have enough initial forage mass, we then must allocate enough pasture area to make sure there is still plenty there by the end of grazing period. Remember, a full bite each and every time!

Nutrients from Pasture and Limitations For Dairy Cows - Provide Adequate Forage Availability

by Dr. Ed Rayburn
West Virginia University
Morgantown, West Virginia

If an adequate amount of pasture is not provided, cattle cannot consume forage at a maximum level even if the chemical analysis of the pasture is high. The forage yield as well as the chemical quality, determine forage intake from pasture (Figure 1).

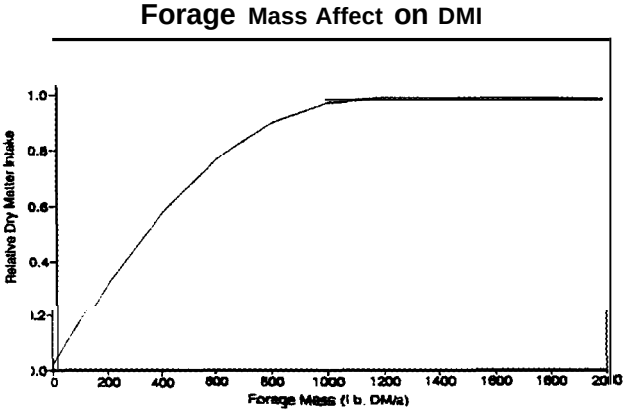


Figure 1. The affect of forage mass per acre on dry matter intake of grazing cattle.

Forage yield is the combination of the tiller height and tiller density of the growing forage. When

height is measured using a ruler and density is estimated by eye, the product of the two is termed the "yield index". This method is not as sophisticated as an electronic pasture probe and is more subjective than a Plexiglas pasture plate, but it is a quick way to estimate the availability of pasture. A mixed orchardgrass-ladino clover stand, eight inches tall and completely closed (100°/0 stand density), would have a yield index of 8. This would yield approximately 2100 pounds per acre of dry matter (DM) when cut to ground level (Figure 2). If the stand had a density of only 75% (yield index= 8" X .75 = 6), the yield would be closer to 1800 pounds per acre. The calibration in Figure 2 is based on mixed pastures containing orchardgrass, timothy, bluegrass, and clovers. Thick bluegrass pastures can have greater tiller densities and, thus, higher yields per inch of height when well fertilized and rotationally grazed.

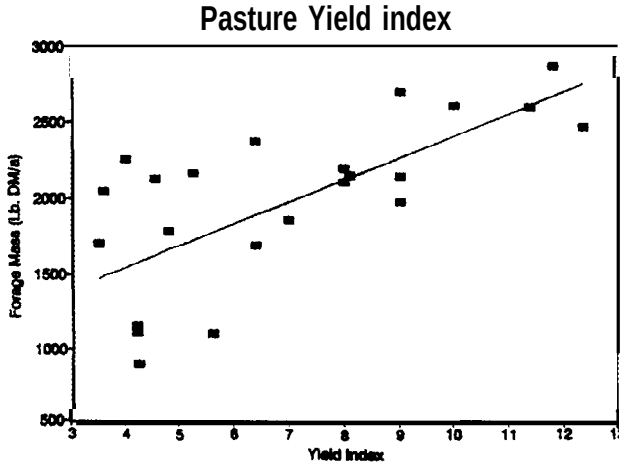


Figure 2. Canopy yield index as an estimate of pasture forage mass per acre.

As depicted in Figure 1, when forage mass is greater than 1000 pounds per acre, pasture intake will be at a maximum. When a herd of cattle is first put on a pasture, the forage intake is high. As the herd consumes the forage, forage intake will stay high for a while. It will then drop off once the animals reduce the forage mass below 1000 pounds per acre. How soon this happens, depends on the stock density (number of 1000 pound animals per acre being grazed) and the length of time the herd is on the pasture. Under rotational grazing the stock density can be defined in terms of daily forage allowance (DFA) as multiples of the potential feed intake (PDMI) required by the grazing herd. If 50 cows weighing 1350 pounds and averaging 60 pounds of milk need 2000 pounds of pasture DM per day, providing a day's grazing of one acre of pasture averaging 2000 pounds DM per acre would be a DFA of one. If two acres of this pasture were provided for one day, it would be a DFA of two. Two acres of this pasture provided to this herd for two days is again a DFA of one.

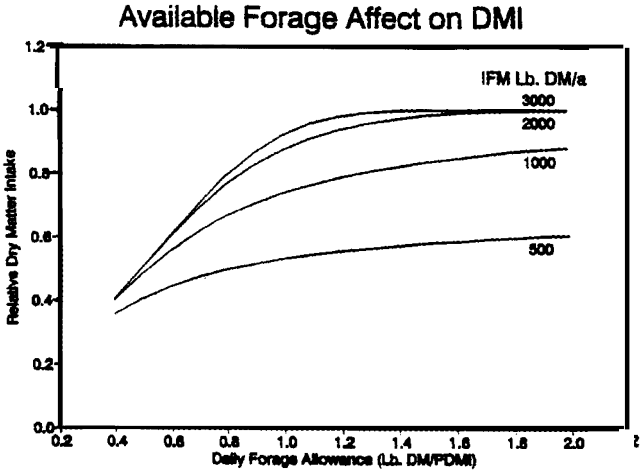


Figure 3. The affect of initial forage mass per acre and daily forage allowance on the relative dry matter intake of grazing cattle.

The amount of DFA allocated and the initial forage mass (IFM) per acre presented to livestock when they are turned into a pasture, determine the effect of forage availability on pasture intake (Figure 3). For high yielding pastures, those with an IFM of 1500 pounds DM per acre or more, a DFA of two will allow the animals to consume a maximum intake. However, this is wasteful of feed, and if practiced without a group of stock to clean up the residue, will result in the loss of white clovers. When feeding supplemental grain, reducing the DFA to between 1.0 and 1.2 maybe required to get the animals to consume the grain allowance. For lower yielding pastures (IFM less than 1500 pounds per acre) increasing the DFA will not necessarily allow the cow to consume all she is capable of consuming. When beginning to use rotational grazing, it is important to have sufficient forage available if the

system is to work. Do not cross fence an old run down hill side pasture and expect the cows to milk. Some of the most successful grazing systems have been developed by rotationally grazing good hay fields.

Prairie grass

FORAGIN' FOR FORAGES

As noted in the Bottomline column, promotion of new products can be misdirected at times. This appears to be the case with a new forage introduction to this country called Matua prairiegrass. As you will learn from the following article by Dave Belesky and Bill Stout from ARS, Matua has some persistence problems that are particularly acute in our northeastern US climate.

There also have been reports of powdery mildew being a problem with Matua during cool, humid, cloudy weather. We can have a lot of those days in the Northeast !

The grass was introduced into this country from New Zealand for pasture use due to its high palatability, drought tolerance, and productive early spring and excellent fall recovery growth. This latter attribute allows a longer pasture season than that provided by other cool season grasses. It also does not decline in quality as fast as other cool season grasses as it matures.

If you still want to give this forage crop a try, heed the advice in the following article. I recommend you also get a copy of Agronomy Facts 29 from Penn State University, Study it and keep it close by as you watch your stand of Matua grow. Be sure to manage it as directed in that fact sheet. You have to be some who likes to pay attention to detail, or you more than likely will lose the stand.

Update on Matua Prairiegrass

By Dave Belesky and Bill Stout, USDA/ARS,

Beckley, WV and University Park, PA

Prairiegrass ***(Bromus willdenowii),*** or rescuegrass ***(B. cathartics)*** as it has been known in the southeastern US, has been widely touted as a remarkable new forage resource available for use in grazing systems, Farmers in the northeastern US seem eager to include Grasslands Matua prairiegrass in their practice. Unfortunately, not all is as it seems with this plant, since studies in West Virginia have shown it to be susceptible to foliar disease and winter damage. Although highly productive at the

outset, Matua seems to lack persistence and competitiveness over time. Also, work in Pennsylvania has shown Matua survival to be very sensitive to fall management.

Persistence problems have also been noted for Matua prairiegrass in other parts of the world, including New Zealand (where the cultivar was developed) and Scotland. Results from studies in Scotland were similar to those from the West Virginia studies, suggesting that prairiegrass would be best suited to areas where the likelihood of winter injury is minimal. In New Zealand, farmers noted lack of persistence, difficult establishment, and unsuitability to local conditions as factors limiting the utility of Matua prairiegrass. In some instances it is considered a short-lived perennial or a reseeding annual. Also, Matua was less productive than timothy, ryegrass, tall fescue, and orchardgrass in New Zealand grazing trails. Although Matua is reported to be responsive to N fertilizer, published reports are limited. The most extensive literature supporting this claim comes from Poland, where prairiegrass is used as a disposal site for animal wastes. Rapid and abundant growth results from the rich nutrient inputs.

Farmers in the northeastern US should consider a trial planting of Matua before deciding how to capitalize upon the beneficial attributes of the cultivar. An acre or two maybe a good way to start out. Since Matua is better suited to well-drained sites and is responsive to N, farmers should avoid sites with drainage problems and be prepared to provided the needed fertilizer inputs to achieve optimum productivity. In hilly terrain, a site with a southern exposure may be best for Matua. Canopy management may also present some challenges since traditional clipping practices do not seem to contribute to persistence and productive stands of Matua. Matua flowers throughout the growing season. Check with your county extension agent or USDA, NRCS office for details on agronomic management.

CROSS FENCING

by Jim Cropper, Editor
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Fresh off the press is a new 16 page brochure printed by the Northeast National Technical Center called, “Farmer Profitability with Intensive Rotational Stocking”. You may want to a request a copy if you are a dairy farmer by directing your request to me here at the Northeast NTC before we close our doors this fall. If you are an Extension Agent or NRCS employee, we can mail you a supply.

“Farmer Profitability with Intensive Rotational Stocking” was written by Lydia Cunningham and Dr. Gregory Hanson of Penn State University. They surveyed 52 farmers in a 5 county area in northeastern Pennsylvania who were intensively stocking their milk cows on pasture. The farmers were selected at random to capture a more typical range of levels of management. As with any practice being used, such as intensive stocking of rotational pasture, each individual improvises the management of it to fit their situation and way of doing things.

The researchers identified the reasons why these farmers adopted intensive rotational stocking. Most of them did so to reduce costs. A third did so because they had always pastured cows, but wanted to improve pasture utilization and milk production without going to confinement facilities. Many of these farmers were also debt averse. They did not want to face high debt payments or wanted to reduce debt they already owed.

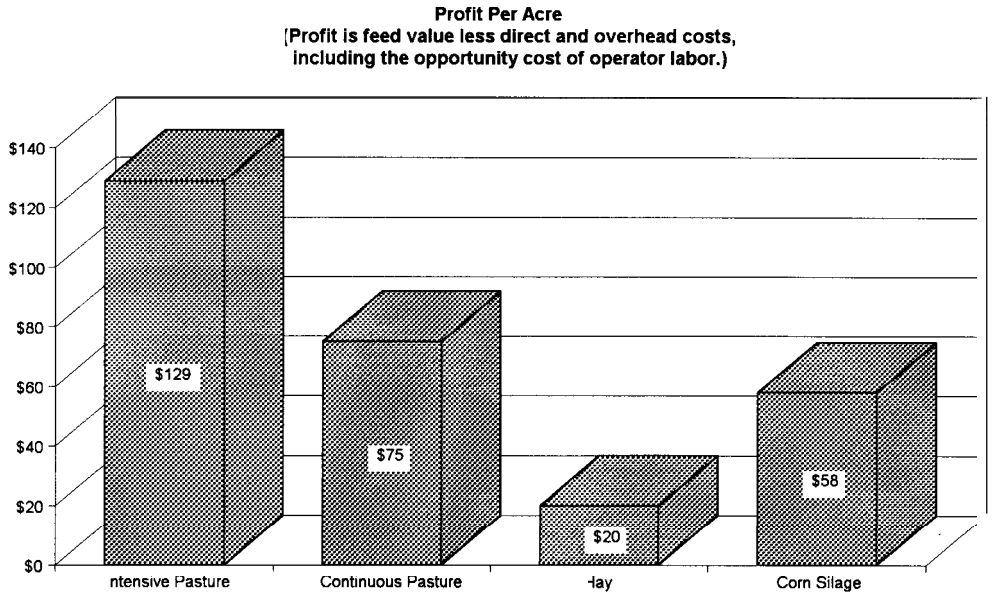
The researchers also review cost, gross returns, and profit per acre by this group of dairy farmers. Intensive pasture was the leader in profit per acre of the four enterprises investigated: intensive pasture, continuous pasture, hay production, and corn silage production. Interestingly enough, continuous pasture came in second to intensive pasture. The contributing factor there was the least direct cost per acre to produce it. Corn silage had the greatest

gross return per acre, but unfortunately also had the highest cost per acre to produce.

Net cash income per cow varied among intensive rotational stocking milk producers from $550 to $646. The more intensive managers produced nearly $100 more net cash income per cow than the least intensive!

The report goes onto give more factual details about why dairy farmers opt to intensify their use of pasture as a feed source. It also notes that the practice of stocking cattle on pasture in a more intensive way is flexible enough to allow for a wide range of management styles. I think you will find the brochure helpful to encourage wider adoption of intensive rotational stocking of milk cows on pasture. It also reinforces the belief that the path chosen was right thing to do!

It is well illustrated with fill color pictures, figures, and tables. Trish Peck, Gail Dishongh, and I were very happy to work with Lydia and Greg to publish this very important piece of research work. I tip my hat to the Government Printing Office for their fine work as well.



MINDING YOUR FENCES

This is the second part of a three part series from a 1993 University of Tennessee Agricultural Extension Service publication on planning and building fences.

In this issue, posts of various types are rated and compared with each other. Always use a post with a life expectancy as good as the wire to be used on it. It does not make much sense to use high tensile wire with a life expectancy of 30 years when the post it's attached to may only last for ten.

Life expectancy of posts is highly dependent on the ground they are placed in. Soils with good water holding capacity and lots of decompose critters can shorten the life expectancy of treated wood posts considerably. That active topsoil layer can rot them into two pieces in 10-15 years, only a third to one half the normal life expectancy. Steel posts can suffer premature rust-through at the ground line too. Some soils are just highly corrosive to steel. Your local NRCS office has the various soil types located on your farm rated for corrosivity to steel and concrete.

Try to select your posts that you buy carefully for straightness. Wood posts with sweeps are difficult to drive and align with the other posts along the line.

Also check wood posts for defects that could cause them to break or split. This is especially critical if

driven into the ground. You could be seriously injured or killed if one were to break and buck out or shatter towards you if you are the one holding the post in place and operating the driver.

Where steel tee posts alternate with wood posts, five steel posts alternate with one wood post often times on flat terrain where no flooding occurs. Typically this is done because a bundle of steel tee posts contains five of them. Where a stronger fence is needed on rolling terrain or on a floodplain, then fewer steel tee posts will be located between wood posts. Always use a rigid post where sharp breaks in grade occur. Steel tee posts can tip or bend easily in such situations. See diagram on next page. Fiber glass and steel rod ones are even worse.

PLANNING AND BUILDING FENCES - POSTS

by James B. Willis, Jr.
Michael J. Buschermohle
Warren Gill, University of
Tennessee, Knoxville, Tennessee

There are many types of posts available (Table 1). Always try to find the best post to meet the demands of the situation. For example, it is best to use good, treated posts for permanent peripheral fence, while light fiberglass posts would be more suitable for constructing temporary cross fences in a controlled grazing cell.

Table 1. Fence Post Characteristics

Post Type	Bending strength	Expected life (yrs)	Initial cost	Fire resistance	Maintenance
Steel-T, concrete	Fair	25-30	Medium	Good	Low
Steel rod 3/8" dia	Poor	15-20	Low	Good	Medium
Heavy-duty fiberglass-T	Fair (flexible)	25-30	High	Poor	Low
Light-duty fiberglass-T	Poor (flexible)	15-20	Low	Poor	Medium
Pressure treated wood	Good	30-35	Medium	Poor	Very Low
Untreated	Good	7-15	Low	Poor	High

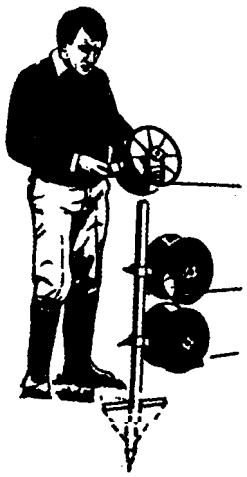
Table 2. Life Expectancy of Wood Posts

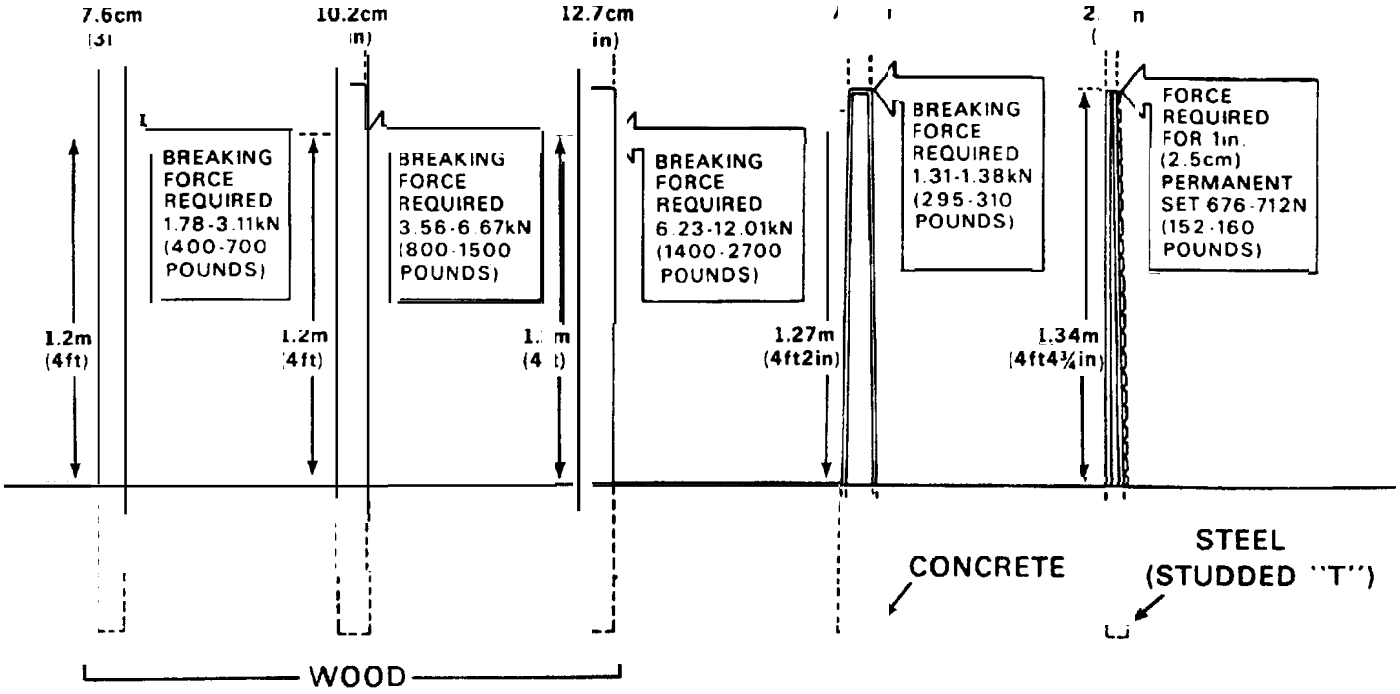
Kind	Untreated	Treated (Pressure)	Treated (Soak)
Osage O.	25-35 yrs		
R. Cedar	15-25 yrs	20-25 yrs	10-20 yrs
B. Locust	15-25 yrs		
W. Oak	5-10 yrs	20-30 yrs	10-20 yrs
Hickory	2-6 yrs	15-20 yrs	10-15 yrs
R. Oak	2-6 yrs	20-30 yrs	10-20 yrs
Y. Poplar	2-6 yrs	20-25 yrs	10-20 yrs
S. Gum	3-6 yrs	20-30 yrs	10-20 yrs
S. Pine	3-7yrs	20-30 yrs	

Often the least expensive option is to utilize home-cut or purchased untreated, wooden posts. These are highly variable in size, shape and durability (Table 2).

Treated posts are typically less variable in quality and shape. Properly treated posts should last thirty to fifty years.

Steel posts are easily put up and durable. They are more likely to shift in the ground under pressure, so are not as good for corner posts or brace posts. A widely used method is to alternate two or three steel posts with a treated wooden post. This combines the best traits of both types of post and is attractive.





From "Planning Fences", American Association for Vocational Instructional Materials (1980).

THE WATER TROUGH

This is the fourth article in a series from a Minnesota Extension publication, "Water Quality for Livestock and Poultry". Harmful microbes contaminating drinking water can also affect livestock adversely. Sanitation is key to prevent them from becoming contaminants. Ordinarily proper well construction can avoid this problem, but water troughs can also become contaminated directly if poorly placed. The water entering the troughs may have been perfectly all right. Older drilled wells can and should be upgraded to prevent inflow of microbes into the well. In sinkhole country, manure runoff into sinkholes can also lead to well contamination. Take measures to stop or redirect manure runoff from known sinkholes. If the sinkhole is plugable, this may be a less costly way to approach the problem if the manure source cannot be moved or diverted easily,

MICROORGANISMS AND IRON IN LIVESTOCK WATER

From: ***Water Quality for Livestock and Poultry,*** by Robert Machmeier, Extension Agricultural Engineer, University of Minnesota, St. Paul, Minnesota

MICROORGANISMS

Coliform bacteria are nearly everywhere and maybe of plant, animal, or soil origin. The term fecal coliform bacteria refers to normal organisms found in the gastrointestinal tract of livestock, humans, and birds. While these bacteria may not be harmful, their presence often indicates that other disease-causing bacteria may also be present.

Harmful microorganisms can readily enter a well having improper surface protection. If the well is situated so as to receive drainage from a feed lot, a well pit or a cracked casing will allow bacteria to enter the water supply. Bacteria such as

Salmonella can cause disease, especially in young animals, and also can indirectly get into the milk supply from dairy herds. Although waterborne illness in livestock due to microorganisms is not often reported in Minnesota, the potential exists for problems to occur, especially where large concentrated animal populations exist and where wells are poorly protected from surface run-off as experienced during spring and with heavy rainfall.

There are no legal limits for microorganisms or chemicals in water used for livestock production except if the farm is a Grade A dairy operation. In this case, the water must be from a supply which provides water of safe and sanitary quality and which is constructed according to the Minnesota Water Well Construction Code. Grade A dairy farms are required to have their water supply tested when going on Grade A and every three years thereafter. The water must also be tested after any repair or modification of the water supply system.

Occasionally, a water tank is located directly under the ventilation exhaust from a livestock building in order to provide a heat source to keep the water from freezing. Consider, however, that the water surface will be directly exposed to microorganisms which are carried out of the structure with the exhausted air. Thus, the watering tank could serve as a source of contamination by water even though the remainder of the water supply system is free of microorganisms. The exhausted air may contain microorganisms and also serve as source of infection when an animal is drinking from water tank located near an exhaust fan.

SOLVING THE PROBLEM

If the water test results indicate the presence of coliform organisms, the water supply system should be checked to determine possible sources of entry. The most common sources for entry of coliform organisms into water supply are near the immediate area of the well itself or into the water storage container, such as a cistern.

Cisterns are usually masonry which is susceptible to cracking. Thus, microorganisms can enter the cistern as the liquid level goes up and down.

Dug wells commonly have poor surface cover and are inadequately protected against the direct entrance of coliform organisms from small animals or from surface run-off which accumulates in the vicinity of the well. Drilled wells which terminate in a well pit are also commonly contaminated by drainage into the pit. If the well is drilled and cased, a pitless underground discharge can be used to replace the well pit. The well pit should be filled with a compacted loam or clay soil and all surface water should be directed away from the well location.

The first requirement of a water supply well is to deliver water free of coliform organisms. It is not sound practice to use chlorine to keep a continuing supply of pathogens in a contaminated well under control. Any failure of the chlorination equipment will immediately expose the livestock and poultry to the pathogens. If the source of contamination in a well cannot be eliminated, the only resource maybe to drill a new well.

Where the possibility exists that animals can transfer pathogens at the drinking point, a chlorine residual of 5 parts per million may be helpful. However, in order for the chlorine residual to remain and destroy whatever microorganisms may enter the water, the watering device must be kept clean.

Troughs should be sited and elevated such that contamination from fecal material is virtually impossible. The “nipple-type” waterer helps to eliminate a source of water contamination between animals. Do not locate an outside water tank directly under a ventilation exhaust fan.

Proper cleaning of poultry waterers on a daily basis is an important part of flock management. A recommended procedure is to scrub water pans or troughs thoroughly with a brush, empty, and then rinse with a disinfectant. Studies have shown that bacteria counts in waterers properly cleaned daily can be kept relatively low. Poor practices in cleaning waterers can result in subjecting birds to water containing millions of bacteria per milliliter.

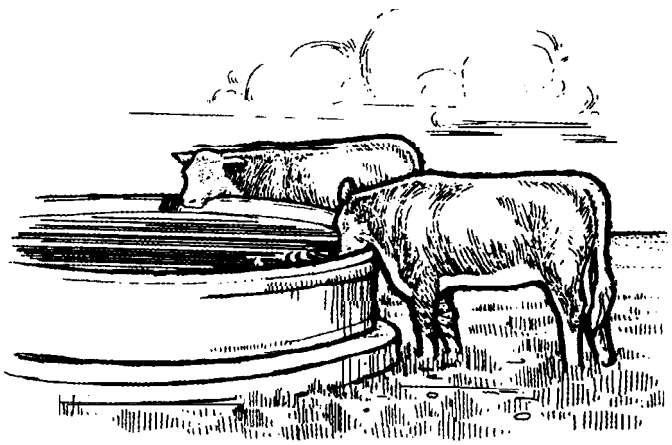
IRON

According to Report No. 2 of the Council for Agricultural Science and Technology, "Under usual conditions, water supplies only a small percentage of the iron available to animals. Because iron from natural sources is absorbed with efficiency less than 10%, the iron in water should not pose a hazard to animals. Under these circumstances, a 'no limit' recommendation is reasonable. High doses of the more available forms of iron, however, are toxic. "

There is no evidence to show that iron will cause any problems with livestock or poultry products. An exception might be the so-called "white veal" trade which tries to develop a pale product based on milk, darkness, and a diet low in iron.

SOLVING THE PROBLEM

Iron can be removed from drinking water with a water softener or with an iron filter. Iron problems and removal techniques are discussed in AG-FO-0584, ***Iron in Drinking Water.***



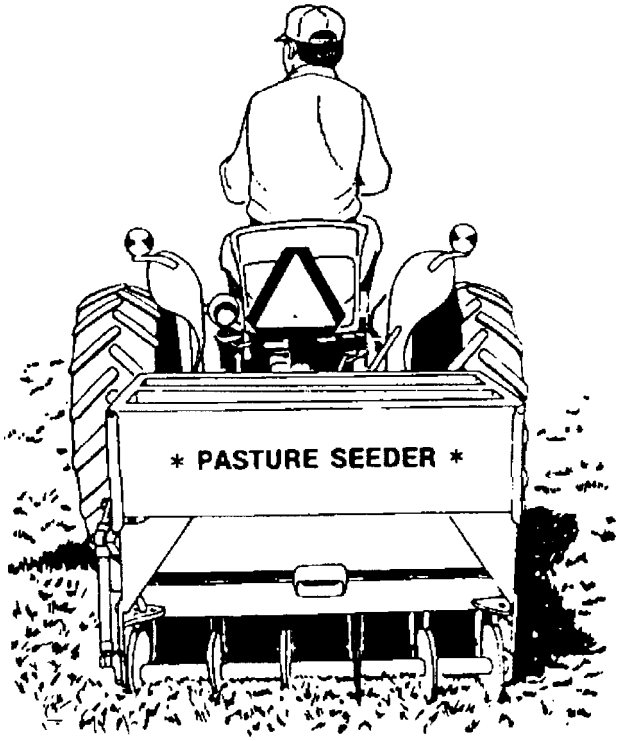
PASTURE PROS

You will probably note a different style to the Pasture Prophet this time. As I mentioned earlier in passing, the Northeast National Technical Center is about to be history. Trish Peck, who did the layout and fine graphic reproduction, is gone. She went on to the U.S. Postal Service to stay in south Jersey area. My fate is still unknown at this time. I hope to put together another issue before leaving the NNTC later this summer. By that time, I hope to announce where you will find me. Hopefully, I can continue as editor. I have had fun putting this together, but often frustrated that I could not put them together on a more frequent basis. Hopefully with NRCS reorganization, I can truly become a grassland specialist. The past year was devoted primarily to getting the Revised Universal Soil Loss Equation ready for field use. My work in that effort has now wound down. Much of the rest of the time required my participation in the reorganization effort to make sure the Agency kept adequate numbers of technical people at the technology transfer level, especially as it pertains to grassland agriculture. This left very little time to put a quality newsletter together. I opted not to do another until I had the time to do all the columns within two or three weeks of each other. Be talking to you again in three months.

Pasture Happenings

Aug 22-23, 1995	Maine Farm Days, Caverly Farms, Clinton, ME. Contact Person: Mitch Michaud (207) 622-8289.
Aug. 26, 1995	Dailey Grazing Tour, Adamsville, OH. Contact Person: Dave Dailey (614) 796-6531.
Aug. 31, 1995	Grazing Field Day, Honey Grove, PA Contact Person: Ed Rits (717) 734-3745.
Sep. 16, 1995	Capitol Soil Conservation District Grassland Workshop/Seminar, Coonskin Park, Charleston, WV Contact Person: Ted Bacui (304) 766-6449.

Nov. 14 Quality Forage Conference,
1995 Tunkhannock, PA. Contact Person:
Mark Madden (717) 278-1158.



Profit Pasture Prophet

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James B. Cropper, Editor

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